higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA
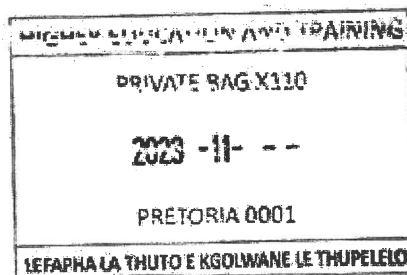
MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING
NQF LEVEL 2

28 November 2023

This marking guideline consists of 5 pages.

QUESTION 1

1.1   1.1.1   True
          1.1.2   True
          1.1.3   False
          1.1.4   False
          1.1.5   False

                                                                (5 × 1)   **(5)**

1.2   A – Motor
         B – Eye shield/Safety shield
         C – Cover/Guard
         D – Wheel/Grinding wheel/Stone/Grinding stone
         E – Tool rest/rest
         F – ON/OFF Switch

                                                                (6 × 1)   **(6)**

1.3   D = 200 mm = 0,20 m✓ (Do not penalise student if didn't convert to m)
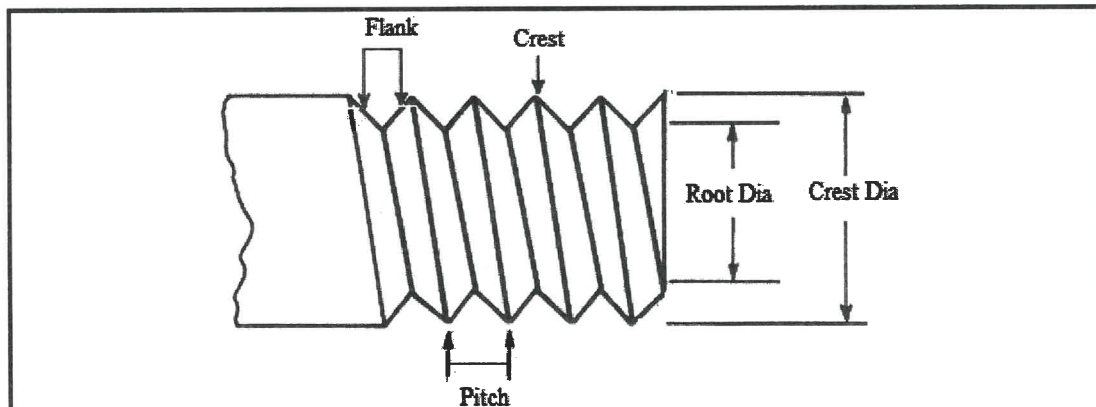   S = 1 670 m/min
         N = ?

         S = πXDXN✓

$$N = \frac{S}{\Pi \times D} ✓$$

$$= \frac{1\,670}{(\pi \times 0{,}20)} ✓✓$$

$$= 2\,658 \text{ r/min} ✓$$

                                                                      (5)

1.4

                                      (ONE mark for accuracy) (5 + 1)   **(6)**
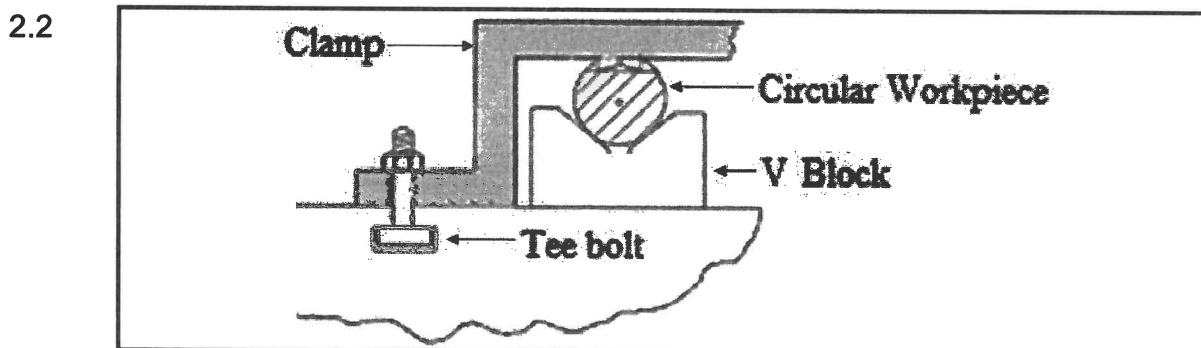
                                              NEATNESS

1.5
- Straight-flute (parallel) reamer
- Helical flute reamer
- Taper reamer
- Expanding reamer
- Adjustable reamer
- Machine reamer (Any 3 × 1) (3)
[25]

QUESTION 2

2.1   A – Motor for elevating the arm
B – Motor for driving the drill spindle
C – Table
D – Base
E – Column
F – Radial arm
(6 × 1) (6)

2.2

(TWO marks for accuracy and neatness) (4 + 2) (6)

2.3   2.3.1   Dry
          2.3.2   Soluble oil
          2.3.3   Soluble oil EP (extreme pressure)
(3 × 1) (3)

2.4
- Select the correct size by its number.
- Remove any burrs and rough edges from the shaft and hub.
- Thoroughly clean the shaft and hub.
- Fit the key by gently tapping it with a soft mallet.
(Any relevant answers) (4)

2.5
- External circlip
- Internal circlip (2 + 2) (4)

2.6   A Helicoil is a spring which has an external and internal thread shape. (2)
[25]

QUESTION 3

3.1
- Parallel turning
- Taper turning
- Screw threads cutting
- Boring
- Drilling
- Parting
- Knurling
- Facing
- Chamfering　　　　　(Any other relevant answers) (Any 5 × 1)　　(5)

3.2
- Insert the cutting tool in the tool post holder and tighten it.
- Insert a solid centre or revolving centre into the tailstock spindle.
- Position the cutting tool tip and tailstock centre together, by rotating the tool post and driving out the tailstock centre.
- If the cutting tool is below/above the point of the tailstock centre, then you need to raise/lower it until it is in line with the point of the centre.
- Adjust the screw until the edge of the cutting tool lines up with the point of the centre in the tailstock.　　　　　(Any other relevant answers)　　(5)

3.3　A – Centre
　　　B – Spindle
　　　C – Spindle locking lever
　　　D – Nut/Screw/Thread
　　　E – Handle Wheel
　　　F – Frame/Housing/Body

　　　　　　　　　　　　　　　　　　　　　　　(6 × 1)　　(6)

3.4
- Speed too high
- Fate rate too high *FEED*
- Parting tool above centre height, which causes excessive rubbing
- Parting tool set too low
- Lack of coolant
- Parting tool not sharpened properly
- Cutting operation is too far from the chuck
- Parting tool not clamped properly
- Work not tightly gripped in a chuck
PARTING TOOL NOT SET 90°　　(Any other relevant answers) (Any 5 × 1)　　(5)

3.5
- A wide range of regular and irregular shapes can be held.
- Work can be set to run concentrically or eccentrically.
- Considerable gripping power, so that heavy cuts can be taken.
- There is no loss of accuracy if the chuck becomes worn.
- The chuck stays accurate, even if it is worn.
- One can readily do facing and boring.
　　　　　　　　　　　　　　　(Any other relevant answers) (Any 4 × 1)　　(4)
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　[25]

QUESTION 4

4.1
- Clean the table of the machine thoroughly (do not use compressed air).
- Clean the vice thoroughly.
- Spread a thin layer of oil on the table surface.
- Gently place the vice on top of the table.
- Obtain machine bolts and place the bolts in the slots of the table and of the vice.
- A washer should be used between the nut and the vice.
- Tighten the bolts.   (Any other relevant answers) (5 x 1)   (5)

4.2   4.2.1   Overarm
       4.2.2   Knee
       4.2.3   Table trips
       4.2.4   Saddle
       4.2.5   Column
                                              (5 × 1)   (5)

4.3   A – Slot cutter _SIDE & FACE COTTER_
       B – T-slot cutter
       C – End-Mill cutter _SLOT DRILL_
       D – Dove-tail cutter
       E – Helical cutter/Ripple cutter
                                              (5 × 1)   (5)

4.4   When manufacturing a work piece, the allowable deviation✓ from the required size (12 mm) may be bigger (12,00 + 0,02 = 12,02 mm)✓✓ or smaller (12,00 - 0,02 = 11,98 mm).✓✓   (Use own discretion for the answers)   (5)

4.5   Loosen the machine vice and place it in line with movement of the table.✓ Obtain a parallel bar/parallel strip that is about the length as that of the vice jaws (the parallel bar should protrude above the vice jaws).✓ Insert a dial test indicator (DTI) in the magnetic stand onto the machine✓ with the needle touching the fixed jaw of the vice. Zero the DTI.✓ Move the table by the handle along the length of the parallel bar. Take note of the reading on the DTI.✓ Loosen the bolts of the vice and adjust the vice until the vice is parallel to the machine and tighten the machine vice bolts when everything is satisfactory.
                                              (Any 5 × 1)   (5)
                                                              [25]

                                              TOTAL: 100